CLAIM AMENDMENTS

1 to 12. *Cancelled*

13. *(Currently amended)* A method for producing differentiated cells from primate pluripotent stem (pPS) cells, comprising:

a) obtaining a culture of pPS cells;

b) ~~optionally~~ initiating differentiation of the pPS cells; and ~~then~~ simultaneously or subsequently

c) culturing the cells of step b) in a medium containing a histone deacetylase inhibitor, until at least ~60% of the cultured cells have at least three of the following characteristics:

- antibody-detectable expression of α_1-antitrypsin (AAT);
- antibody-detectable expression of albumin;
- absence of antibody-detectable expression of α-fetoprotein;
- RT-PCR detectable expression of asialoglycoprotein receptor (ASGR);
- evidence of glycogen storage;
- evidence of cytochrome p450 activity;
- evidence of glucose-6-phosphatase activity; or
- the morphological features of hepatocytes.

14. *(Previously presented)* The method of claim 13, wherein at least about 60% of the cells have at least five of said characteristics.

15. *(Previously presented)* The method of claim 13, wherein at least about 80% of the cells have at least seven of said characteristics.

16. *(Previously presented)* The method of claim 13, wherein the histone deacetylase inhibitor is n-butyrate.

17. *(Previously presented)* The method of claim 13, wherein the histone deacetylase inhibitor is propionic acid, isovaleric acid, or isobutyric acid.

18. *(Previously presented)* The method of claim 13, wherein the histone deacetylase inhibitor is Trichostatin A.

19. *(Previously presented)* The method of claim 13, wherein differentiation of the pPS cells is initiated by forming embryoid bodies.

20. *(Previously presented)* The method of claim 13, wherein differentiation of the pPS cells is initiated by culturing in a medium containing dimethyl sulfoxide (DMSO), dimethylacetamide (DMA); hexmethylene bisacetamide, or another polymethylene bisacetamide.

21. *(Previously presented)* The method of claim 13, comprising further culturing the cells in a medium containing a cytokine or hormone selected from glucocorticoids, epidermal growth factor (EGF), insulin, TGF-α, TGF-β, fibroblast growth factor (FGF), hepatocyte growth factor (HGF), IL-1, IL-6, IGF-I, IGF-II, and HBGF-1.

22. *(Previously presented)* The method of claim 21, wherein the cells are cultured in a medium containing at least three of said cytokines or hormones.

23. *(Previously presented)* The method of claim 22, wherein the cells are cultured in a medium containing EGF, TGF-α, and HGF.

24. *(Previously presented)* The method of claim 13, further comprising maintaining the differentiated cells by culturing them in a medium containing a histone deacetylase inhibitor.

25. *(Previously presented)* The method of claim 13, further comprising maintaining the differentiated cells by culturing them in a medium containing n-butyrate.

26. *(Previously presented)* The method of claim 27, wherein the pPS cells are human embryonic stem cells.

27. *(Currently amended)* A method for maintaining hepatocyte lineage cells in culture, comprising:

a) obtaining a population of cells differentiated from an established culture of primate pluripotent stem (pPS) cells, ~~comprising~~ wherein at least ~60% of the differentiated cells have at least three of the following characteristics:

- antibody-detectable expression of α_1-antitrypsin (AAT);
- antibody-detectable expression of albumin;
- absence of antibody-detectable expression of α-fetoprotein;
- RT-PCR detectable expression of asialoglycoprotein receptor (ASGR);
- evidence of glycogen storage;
- evidence of cytochrome p450 activity;
- evidence of glucose-6-phosphatase activity; or
- the morphological features of hepatocytes; and then

b) culturing the differentiated cells in a medium containing a histone deacetylase inhibitor, so that at least ~60% of the cultured cells maintain ~~at least three of the following characteristics:~~

- ~~antibody-detectable expression of α_1-antitrypsin (AAT);~~
- ~~antibody-detectable expression of albumin;~~
- ~~absence of antibody-detectable expression of α-fetoprotein;~~
- ~~RT-PCR detectable expression of asialoglycoprotein receptor (ASGR);~~
- ~~evidence of glycogen storage;~~
- ~~evidence of cytochrome p450 activity;~~
- ~~evidence of glucose-6-phosphatase activity; or~~
- ~~the morphological features of hepatocytes~~

said characteristics.

28. *(Currently amended)* A method for producing differentiated cells from human embryonic stem (hES) cells, comprising:

a) obtaining a culture of hES cells;

b) ~~optionally~~ initiating differentiation of the hES cells; and ~~then~~ simultaneously or subsequently

c) culturing the cells of step b) in a medium containing a histone deacetylase inhibitor, until at least ~60% of the cultured cells have at least three of the following characteristics:

- antibody-detectable expression of α_1-antitrypsin (AAT);
- antibody-detectable expression of albumin;
- absence of antibody-detectable expression of α-fetoprotein;
- RT-PCR detectable expression of asialoglycoprotein receptor (ASGR);
- evidence of glycogen storage;
- evidence of cytochrome p450 activity;
- evidence of glucose-6-phosphatase activity; or
- the morphological features of hepatocytes.

29. *(Previously presented)* The method of claim 13, wherein the pPS cells are cultured with the histone deacetylase inhibitor without previously initiating differentiation.

30. *(Previously presented)* The method of claim 13, wherein the pPS cells are cultured on an extracellular matrix without feeder cells before contact with the histone deacetylase inhibitor.

31. *(Previously presented)* The method of claim 28, wherein at least about 60% of the cells have at least five of said characteristics.

32. *(Previously presented)* The method of claim 28, wherein at least about 80% of the cells have at least seven of said characteristics.

33. *(Previously presented)* The method of claim 28, wherein the histone deacetylase inhibitor is n-butyrate or Trichostatin A.

34. *(Previously presented)* The method of claim 28, comprising pre-differentiating the cells by culturing in a medium containing dimethyl sulfoxide (DMSO), dimethylacetamide (DMA); hexmethylene bisacetamide, or another polymethylene bisacetamide.

35. *(Previously presented)* The method of claim 28, comprising further culturing the cells in a medium containing at least three cytokines or hormones selected from glucocorticoids, epidermal growth factor (EGF), insulin, TGF-α, TGF-β, fibroblast growth factor (FGF), hepatocyte growth factor (HGF), IL-1, IL-6, IGF-I, IGF-II, and HBGF-1.

36. *(Previously presented)* The method of claim 34, wherein the cells are cultured in a medium containing EGF, TGF-α, and HGF.

37. *(Previously presented)* The method of claim 27, wherein at least about 60% of the cells have at least five of said characteristics.

38. *(Previously presented)* The method of claim 27, wherein at least about 80% of the cells have at least seven of said characteristics.

39. *(Previously presented)* The method of claim 27, wherein the histone deacetylase inhibitor is n-butyrate.

40. *(Previously presented)* The method of claim 27, wherein the histone deacetylase inhibitor is Trichostatin A.

Upon allowance of the application, please renumber the claims as follows:

Claim	13	→	1
	14	→	2
	15	→	3
	16	→	4
	17	→	5
	18	→	6
	19	→	9
	20	→	10
	21	→	11
	22	→	12
	23	→	13
	24	→	14
	25	→	15
	26	→	28
	27	→	23

Claim	28	→	16
	29	→	7
	30	→	8
	31	→	17
	32	→	18
	33	→	19
	34	→	20
	35	→	21
	36	→	22
	37	→	24
	38	→	25
	39	→	26
	40	→	27